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General Notes.

GEOLOGY AND PALEONTOLOGY.

On the Formation of Oolite.—Dr. A. Rothpletz has proposed a theory of the formation of oölite, which is as interesting as it is novel. He noticed on the shores of Great Salt Lake, Utah, snow-white and silver-gray calcareous corpuscles in great numbers. They form a large part of the beach sand, and where they lie in the water they are partly covered with a bluish-green alga-mass. On examination the algoid bodies proved to be colonies of cells of the lime secreting algæ, Glœocapsa and Glœothece. By a series of experiments Dr. Rothpletz satisfied himself that the calcareous bodies secreted by the plants and the calcareous bodies which compose the beach sand are identical. Pursuing his researches, the author investigated the oölites from the strand of the Red Sea, and found that although slightly differing in structure, these oölites originate similarly to those of Salt Lake; that is, from lime secreting algæ.

In studying fossil forms Dr. Rothpletz has found in a gray limestone from the Lias of the Vilser Alps, and in the great oölite structure of the Wettersteinkalk structures analogous to the calcareous bodies from Salt Lake. Also the structure of certain calcareous oölites investigated by Wethered, and more recently by Bleicher (May, 1892), closely resembles that of the Red Sea oölite. In view of these facts, Dr. Rothpletz is inclined to believe that at least the majority of the marine calcareous oölites with regular zonal and radial structures are of plant origin; the product of microscopically small algæ of very low rank, capable of secreting lime.—From *Botanisches Centralblatt.* Translated by F. W. Cragin for the *American Geologist,* Nov., 1892.

Geology of Northeastern Alabama.[4]—Mr. Hayes' report covers the topography, drainage, stratigraphy and structure of Northeastern Alabama and adjacent portions of Georgia and Tennessee. It is intended as a basis for the economic geology of that region, and is, therefore, general rather than special and detailed. The rocks of the

[4] Report on Geology of Northeastern Alabama and adjacent portions of Georgia and Tennessee. Bulletin No. 4, Geological Survey of Alabama. By C. Willard Hayes, Assistant Geologist U. S. Geol. Surv., 1892.

area under consideration are all Paleozoic, and include representatives of all the larger subdivisions of that system. A columnar section of the strata exposed east of Browntown Valley gives the Cambrian rocks an average thickness of 7550 feet; the Silurian, 5935 feet; the Devonian, 180 feet; and the Carboniferous, 2175 feet. The formation names are all new, being purely geographic and local. It is questionable if the making of new names is necessary in regions contiguous to those with similar formations whose names have been generally adopted. The reason advanced, "to avoid all remote correlations," does not seem sufficient to warrant such innovations.

The report is accompanied by an excellent Geological map which shows a structure section through Northeastern Alabama.

The Mesosauria of South Africa.—Paleontologists are indebted to Prof. H. G. Seeley for a detailed description of the Mesosauria of South Africa, and an exact statement of the relations of Mesosaurus with Stereosternum.

For many years the genus Mesosaurus has been evidenced by a single fossil from Griqualand, South Africa, described by Gervais in 1865 under the name *Mesosaurus tenuidens.* In 1878 four specimens from the shale at the margin of the Kimberley Diamond field were obtained by Mr. G. H. Lee, and deposited in the British Museum. They show that Mesosaurus was a long-tailed reptile, with hind limbs well developed. Mr. Seeley found it impossible to refer the Kimberley specimens to *M. tenuidens*, and described them under the name *M. pleurogaster*. The well-developed abdominal ribs, formed of flattened plates, give this species its most distinctive feature.

A second specimen of *M. tenuidens* found in the district of Albania by David Arnold, preserved in the Cape Town Museum, shows the ventral aspect of the anterior part of the skeleton. There are some differences between this specimen and the type, but Mr. Seeley does not consider them important enough to prove specific distinction.

Another specimen of the same genus, from near Burghersdorf, is in the Albany Museum at Grahamstown. It shows the dorsal aspect of dorsal vertebræ and ribs. It indicates a new species, but there is no character available for its definition except that of relatively stout ribs.

In discussing the relations of Mesosaurus with Stereosternum, Mr. Seeley refers to *Stereosternum tumidum* from Brazil, described by Cope in 1886, and figures the shoulder girdle of that species to show a pair of wide, thin, crescentic bones in advance of the shoulder girdle. In regard to these bones Mr. Seeley says: "If the transverse expansion seen in the Paris type of *Mesosaurus* is the same bone, its form is imperfect, but it is in the same position as the lateral crescentic bone of *Stereosternum*. There is nothing in the Cape Town *Mesosaurus* which corresponds in form with these bones in *Stereosternum*, and the shoulder girdle in the two types seems to be unlike, because the coracoids in the Brazilian genus met (as shown by the thickened margin) in the median line, while in *Mesosaurus* there seems to have been a squamous overlap as in Monotreme mammals, and as the coracoid cartilages overlap in *Triton* and *Salamandra*. This condition, so far as I am aware, is not otherwise suggested by remains of fossil reptiles. There is also a possible resemblance to Salamanders in the fact that the scapula and coracoid are not separable, though the Cape Town *Mesosaurus* appears to indicate a suture.

These African Sauromorpha closely resemble some genera from the Trias of Europe in general form and characters of the humerus. This leads Mr. Seeley to present, for the present, the following classification of a small group to which he gives the name "Mesosauria:"

MESOSAURIA.

General Characters.—Palate closed in the median line, teeth slender, prehensile; cervical ribs with a single articulation, dorsal ribs articulated to the anterior face of the neural arch. The shoulder-girdle formed of scapular and clavicular arches. Humerus expanded distally with an ent-epicondylar foramen. Digits terminating in claws.

Division I. Proganosauria.

Articular faces of centrum conically cupped, coracoid and scapula anchylosed, a large clavicle (or separate episcapulæ), a sacrum of four vertebræ, a foramen in the pubis, five bones in the distal row of the tarsus, neck short, tail long. South Africa, South America.

Division II. Neusticosauria.

Articular faces of centrum flat, coracoid and scapula separate, clavicles relatively small (no separate episcapula), sacrum unknown, a notch instead of a foramen in the pubis, neck long, tail short. Europe.

This order is an important diagnostic type of its horizon, and all additional knowledge respecting it is welcome.

Quarterly Jour. Geol. Soc., Nov., 1892.

Kansas Pterodactyls.—The wealth of material in the museum of the Kansas University affords Prof. Williston the opportunity to compare the genera Nyctodactylus, Pterodactylus and Pteranodon, with the following result:

"It seems very probable that the genus Nyctodactylus has no teeth in its jaws; it agrees in *every other respect* with the genus Pterodactylus, so far as known. Now, in not a few species of Pterodactylus the teeth are confined to the anterior end of the jaws, and their entire absence, unaccompanied by other structural differences, will hardly constitute an order, or even a family.

"Pteranodon differs from Pterodactylus, so far as that genus is known, in the united coracoscapulæ and pubes, both of which characters are found in Rhamphorhynchus.

"The sole family characters remaining then, for Pteranodon, are absence of teeth, a supra-occipital crest, and the articulation of the upper end of the scapula."

Prof. Williston, therefore, proposes the following classification:

Order Pterosauria.
Family Pterodactylidæ; sub-families, Pteranodontinæ, Pterodactylinæ.
Family Rhamphorhynchidæ.
Family Ornithocheiridæ.—Kansas University Quarterly, July, 1892.

Geological News, General.—Prof. S. W. Williston considers the practice of American text-books in Geology in introducing generic names of characteristic fossils as the names of the geological horizons whence they come as very reprehensible. Leconte's Elements contains a long list of such names that have long been out of use by paleontologists.—Kansas Univ. Quart., July, 1892.——According to T. Mellard Reade, marine sands are rounded and highly polished, while non-marine but purely glacial sands are invariably angular.—*Geological Magazine*, Oct., 1892.——M. Boule calls attention to some well-preserved remains of *Elephas meridionalis* found in the volcanic terranes of Senèze (Haute-Loire). They resemble *E. meridionalis* of the English Crag. This fossil confirms M. Boule's previous statement that while some of the volcanoes of the valley of the Allier (Coupet and Chilhas) were active during the middle Pliocene, others, like Senèze, are contemporary with *E. meridionalis*, and are therefore more recent.—*Revue Scientifique*, Nov., 1892.

Paleozoic.—A new form of the rare group Agelacrinitidæ has been found in the lower carboniferous limestone of Cumberland, England. The fossil is described and figured in the Quart. Jour. Geol. Soc. May, 1892, under the name *Lepidodiscus milleri*, by G. Sharman and E. T. Newton.——Mr. H. G. Seeley describes a new reptile from Welte Vreden, Cape Colony, *Eunotosaurus africanus*. The dorsal vertebræ in form and number suggest the Chelonian type, but the specimen affords no proof that the whole of the dorsal vertebræ are preserved. Every character preserved differs from those of South African fossils hitherto known, with the exception of the pubis, which suggests that the specimen is referable to the Mesosauria in a division distinct from the Proganosauria.—Quart. Jour. Geol. Soc., Nov., 1892.——Eleven new species of Lower Silurian Ostracoda referable to the two genera Leperditia and Schmidtella are described and figured by E. O. Ulrich in the Amer. Geol., Nov., 1892.

Mesozoic.—Mr. Arthur Hollick calls attention to some fossil molluscs found at Tottenville and Arrochar, Long Island. Prof. Whitman has determined them to be marine cretaceous species. These, in connection with cretaceous plants found in the same locality, establishes the cretaceous strata which have hitherto been assumed to extend along the southern and western shores of Long Island.—Trans. New York Acad. Sci., 1892, p. 96.——A new Mosasaur, *Clidastes westii*, is described by Mr. Williston. The fossil was found in the uppermost of the Niobrara beds, and consists of a complete lower jaw, quadrate, portions of the skull, the larger part of the vertebral column, and the incomplete hind and fore paddle. It is estimated that the animal in life measured seventeen and one-half feet.—Kansas Univ. Quart., July, 1892.——Mr. Uhler's observations show three structural units in the Tuscaloosa formation instead of the one insisted upon by McGee and Darton. His division is as follows: 1 The Potomac formation proper laid down on the broken border of the crystalline rocks and capped by the variegated clay. 2 The Albirupean formation, which includes the series of clays, sands and cobble-stone deposits resting between the variegated clay and the base of the Severn formation. 3 Alternate clay sands resting upon the irregular and eroded surface of the white clay or sand of the preceding group.—Trans. Maryland Acad. Sci., 1892.

Cenozoic.—The collection of fossil marsupials at Queensland includes a fine series of mandibles of *Phascolomys mitchellii*, which support Mr. De Vis in making this a distinct species from *P. platyrhinus*. —Proceeds. Linn. Soc. N. S. W., 1891.——Two species, *Laganum* *decagonale* and *Cassidulus florescens,* have been added by Mr. Gregory to the Australian fossil Echinoidea. The papers recently published by Cotteau, Tate, Bittner, and Gregory on Australian Cenozoic Echinoids, show that the fauna in question is Eocene and Oligocene instead of Miocene, and that it is remarkably rich and varied in genera.—*Geol. Mag.,* Oct., 1892.——A collection of mammalian bones from Mongolia reported on by Lydekker are of interest since they carry the Chinese mammalian fauna to a more northern district than has hitherto been known, and they indicate two Indian Siwalik species not previously recorded from Chinese territory, viz., *Hyœna macrostoma* and *Equus sivalensis.*—Records Geol. Surv. India, Vol. xxiv.